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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,347	05/01/2001	Frederick F. Wood	1400-26	2584

7590 08/05/2003

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EXAMINER	
CAPUTO, LISA M	
ART UNIT	**PAPER NUMBER**
2876	

DATE MAILED: 08/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/845,347	Applicant(s) WOOD, FREDERICK F.
	Examiner Lisa M Caputo	Art Unit 2876

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40 and 42-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40 and 42-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Amendment

1. Receipt is acknowledged of the amendment filed 14 May 2003.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 6-22, 25-31, 34-40 and 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krichever et al. (U.S. Patent No. 5,144,120, from hereinafter "Krichever") in view of Bard et al. (U.S. Patent No. 5,410,140, from hereinafter "Bard") and Knowles (U.S. Patent No. 4,983,818).

Krichever teaches a mirrorless scanner with movable laser, optical and sensor components. Krichever discloses that during the alternate, repetitive oscillations of the shaft 22, the support 26 and the subassembly 28 likewise participate in this oscillatory movement, thereby causing the beam spot to be swept in an arc whose center of curvature is located at the diode across the symbol at the reference plane and to trace a curved scan line thereat. Hence, no longer is a mirror used to effect sweeping of a beam spot across a symbol, but, instead, other scanner components are moved and, in the embodiment of FIG. 1A, these other components comprise the laser diode 32 and the optical components which are jointly turned as a unitary structure about an axis parallel to the reference plane. A portion of the light reflected off the symbol passes

along a return path through a second window 42 on the housing in the direction of arrow B to a photodetector 44 for detecting the variable intensity of the returning portion of the reflected laser light over a field of view; and for generating an electrical analog signal indicative of the detected variable light intensity. In the FIG. 1A embodiment, the photodetector 44 is stationarily mounted on the printed circuit board 46. Printed circuit boards 48 and 50 at either side of board 46 contain signal processing circuitry 52 and microprocessor control circuitry 53 for converting the analog electrical signal to a digital signal, and for processing the digital signal to data descriptive of the symbol being read. Details of the signal processing and microprocessor control circuitry can be had by reference to the above-identified patents and applications. A two-part multi-wire plug-in cable connector 54 has one part electrically connected to the signal processing and microprocessor control circuitry and another part electrically connected to a flexible multi-wire cable 54' connected to a display 55 and a keyboard 56. A rechargeable battery pack 58 supplies power to the laser diode and the electrical circuitry in the housing. By moving only the laser diode and the optical component relative to the stationary photodetector, power from the battery pack is conserved (see Figures 1A-1B, col 6 lines 13-53). Turning now to the embodiment of FIGS. 5-7, like reference numerals again identify like parts. The oscillating motor 20, once again, has an output shaft 22 on which a support 80 is mounted. Rather than being U-shaped like support 26, support 80 is L-shaped and has an upright leg 82. A laser/optics subassembly 28 is mounted on leg 82. A photodetector 44 is stationarily mounted on printed circuit board 46. Coiled tensile wire group 68 interconnects the diode 32 and electrical circuitry on

board 46. Collecting lens 72 is mounted on leg 82 in a coaxially surrounding relationship with subassembly 28. The lens 72 and the subassembly 28 turn as a unit in either direction of double-headed arrow 76, whereas photodetector 44, in contrast to the previous embodiment of FIG. 3, is stationary (see Figures 5-7, col 7, lines 47-61). Hence regarding claims 1, 15-16, and 29-30, Krichever teaches a device comprising a printed circuit board (the circuit board, although not specified in size, is relatively small due to the nature of the scanner and hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a 4x4 mm circuit board as recited in claims 3, 22, and 31), and a moving beam scanner which comprises a substrate, a laser light source and a photodiode mounted to the substrate, focusing and collecting lenses, and a cap mounted over the substrate. In this embodiment the housing is the barcode scanner, which is conventionally shaped with a trigger.

Regarding claims 1 and 17, Krichever fails to teach that there is means for providing an oscillating magnetic field. Regarding claim 15, Krichever fails to teach the correct positioning for the elements (i.e. the scanning component is positioned adjacent to and outside the cap).

Bard teaches a mirrorless ring mounted miniature optical scanner. Bard teaches that to reduce the size and weight of an optical scanner, the present invention provides a mirrorless beam scanning unit wherein the light emitter itself moves back and forth. In the preferred embodiments the light emitter is a visible light diode (VLD) mounted on the axis of a rotatable shaft. The VLD emits light in a direction perpendicular to the axis of the shaft. A lever arm attached to the shaft and an induction motor for moving the arm

repeatedly rotate the shaft back and forth through a small rotational arc. The mirrorless scanner is mounted on a finger-sized ring. This allows a user to wear the miniature optical scanner on a finger. A separate unit houses the other components of the scanning system, such as the analog signal processing circuitry, digitizer, decoder and any necessary interface to a data processing system. The separate unit can be worn on the user's belt or in a pocket, and a cable connects the separate unit to the ring mounted scanner (see abstract). Bard discloses that FIG. 1 depicts a mirrorless scanning unit 1 of the present invention. A light emitter, such as a visible laser diode or VLD 11, emits a beam of light to generate a scan line. The VLD 11 may be mounted on the pivotable shaft of a motor or on any material means capable of producing oscillating motion. In the preferred embodiment of scanning unit 1, the VLD 11 is attached to the top end of a rotatable or pivotable shaft 13. The shaft 13 is pivotably mounted in a scanner base 50. The shaft can be installed either on any known Type of bearing or just to rotate in the plastic body of base 50. The VLD 11 and shaft 13 together form a moving assembly 10 for scanning the beam of light from the VLD type light emitter. The moving assembly 10 also includes a collar 12 and a lever arm 14 attached to the shaft 13. A force applied to the end of lever arm 14 produces the oscillatory movement of assembly 10, as will be discussed later. The collar 12 secures the VLD 11 to the moving assembly 10. In the preferred embodiment, the VLD 11 is secured at a point atop of the shaft 13, such that VLD 11 is effectively located on the pivot axis of the shaft 13 and aligned to emit light in a direction perpendicular to the axis of the shaft. Other arrangements of the VLD and shaft are possible. For example, the VLD could be

located at a position offset from the axis. Also, the collar could support the VLD at an angle with respect to the shaft. FIG. 2 illustrates the relationship of the motion and light emission of the VLD 11 to the axis of the shaft 13. The short rotational arc o about the shaft axis represents the back and forth pivotal oscillation of the VLD 11. The VLD 11 emits light in direction I toward a targeted object, such as a bar code (not shown). As the VLD 11 of assembly 10 oscillates back and forth through the small rotational arc o, the emitted light I will scan back and forth across the targeted image. As shown in FIG. 1, three thin wires 15 connect the leads of the VLD 11 on one side to a stationary holder 17 on the other. Alternatively, one flexible cable could be used. In the preferred embodiment, the wires 15 or cable are attached to an intermediate fixing point 16 atop the collar 12. The point 16 is located at the axis of the oscillation of moving assembly 10 and shaft 13 to minimize tension on the lead wires due to the zero linear speed at that point. Alternatively, the wires could be slack and hang loose or be coiled, so long as the wires provide a flexible connection to the oscillating VLD. A variety of devices can be used to provide the force to oscillate the moving assembly 10 about the axis of shaft 13. In the illustrated embodiment, the oscillation of the assembly is provided by a so-called induced magnetization motor (hereinafter IMM). The IMM type motor has been disclosed in commonly assigned application Ser. No. 07/520,464, filed on May 8, 1990, entitled SCANNING ARRANGEMENT. In the prior application the IMM oscillated a scanning mirror. The disclosure of this commonly assigned application is herein incorporated by reference. In the IMM type motor, a restoring force is provided by the combination of a fixed position core and coil with a moveable permanent magnet. If the

permanent magnet is mounted on the end of a lever arm attached to rotatable shaft, the force takes the form of a torque about the axis of the shaft. In the present embodiment of the IMM, a core 21 comprises a bobbin around which the coil 23 is wound such that the core and coil are entirely concentric to minimize size and weight. The permanent magnet 25 is rigidly mounted at the end of the lever arm 14 of the moving assembly 10. Location of the permanent magnet 25 at a distance from the axis of the shaft 13 causes the magnetic force applied to the lever arm 14 through the permanent magnet 25 to produce a torque about the axis of the shaft 13 (see Figures 1-2, col 5 line 19 to col 6 line 25).

In view of the teaching of Bard, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ means for providing an oscillating magnetic field because an oscillating magnetic field is a conventional, simple, and efficient way to provide power to drive objects, in this case a shaft for a scanning component. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to position the scanning component outside the cap so that there is ample space to drive the scanning component.

Regarding claims 1, 15, and 29, Krichever as modified by Bard fails to teach a flexible connector that mechanically couples the scanner and the circuit board such that a range of oscillation between the scanner and circuit board is possible.

Knowles teaches a data acquisition system with laser scanner module. Knowles discloses that in FIGS. 4-6 there is shown an alternative embodiment of this invention.

In that embodiment the system is designated by the reference numeral 300 and basically comprises a scanner 20 and a data terminal 200. However, unlike system 10, the scanner 20 of this embodiment includes mounting means to enable it to be adjusted to various spatial orientations with respect to the terminal. This feature enables the scanner 20 to be oriented in the most desirable orientation for the particular user and scanning application. Examples of the adjustability of the scanner module with respect to the data terminal is shown by the phantom lines in FIGS. 4 and 6. Thus, as can be seen therein the module can be adjusted either up or down and/or side to side with respect to the terminal. To accomplish the directional adjustability the system 300 makes use of a gimble mount 302 to mechanically support the scanner 20 on the data terminal 200. Since the scanner's orientation is adjustable, its housing 22 does not include the angled base portion 30 of the embodiment shown in FIG. 1. Thus, the housing 22 merely comprises a body portion 28. The electrical interconnection between the scanner and the data terminal is effected by an electrical connector socket 304 (FIG. 5) and an associated plug 306 (FIG. 4). The plug is located at the end of a coiled cable 308 which, like previously identified cable 38, carries the electrical signals to and from the scanner. As should be appreciated by those skilled in the art any suitable conventional electrical plug and socket can be utilized in lieu of the plug and socket shown herein. The gimble mount is shown clearly in FIGS. 4 and 5 and basically comprises a ball 310 mounted on the end of an arm 312. The arm is fixedly secured to the housing 22 of the scanner at the interface of its rear wall 28B and bottom wall 28E. The ball 310 is adapted to be received within a split socket 314 fixedly secured to the

top wall of the data terminal at its interface with the bottom surface 206. With the ball 310 in place in the socket 314 the arm 312 is located within a slot 316 so that the module can be rotated about an axis 318 (FIG. 5) to effect the up-down orientation of the scanner, with the extent of adjustability being established by the length of the arc of the slot 316, or about the longitudinal axis of the arm 312 to effect the side-to-side orientation of the module (see Figures 4-6, col 8, line 45 to col 9 line 23). Hence, Knowles teaches a flexible connector to couple the scanner (20) to the circuit board (data terminal 200).

In view of the teaching of Knowles, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a flexible connector so that the scanner can be used in different orientations in order to reach different items and be more user-friendly to the customer.

Regarding claims 6, 25, and 36, Krichever fails to teach that the elements are plastic.

Bard teaches that in the preferred embodiment of scanning unit 1, the VLD 11 is attached to the top end of a rotatable or pivotable shaft 13. The shaft 13 is pivotably mounted in a scanner base 50. The shaft can be installed either on any known Type of bearing or just to rotate in the plastic body of base 50. The VLD 11 and shaft 13 together form a moving assembly 10 for scanning the beam of light from the VLD type light emitter. The moving assembly 10 also includes a collar 12 and a lever arm 14 attached to the shaft 13. A force applied to the end of lever arm 14 produces the

oscillatory movement of assembly 10, as will be discussed later (see Figure 1, col 5, lines 25-36). Plastic components are well known in the art to be versatile, inexpensive, and efficient.

In addition, Knowles teaches that in the interest of ease of assembly of the scanner 20, its housing 22 is formed of two molded, e.g., plastic, components, namely an upper shell 22A and a lower shell 22B. When the two shells are assembled together along seam line 22C, they complete the housing 22. The shells can be readily disassembled to enable ready access to the scanner engine 100 located in the interior of the housing 22. This action thereby facilitating manufacture of the scanner and subsequent servicing of its engine (see Figures 2, 4, col 5 line 64 to col 6 line 5).

In view of the teaching of Bard and Knowles, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ plastic components because they are well known in the art to have advantages over other materials (i.e. they are durable and versatile).

Regarding claims 12 and 28, Krichever fails to teach that the range of oscillation is +/- 20 degrees relative to the central rest position.

Bard teaches that in an embodiment actually built, the mirrorless scanning unit was only 1" long, by 1.25" high, by 0.625" wide. The exterior dimensions of the housing 81 containing the mirrorless are 1.1" long, by 1.4" high, by 0.7" wide. It takes only 13.5 mA and 3.5 V to operate the mirrorless scanner. Scan angle is .+-.20.degree.. Unit weight is less than one ounce (27.5 grams). Such a hand unit 80 can easily be worn on

a finger like an ordinary ring, leaving the operator's hands (including that finger) absolutely free (see col 8, lines 3-12).

In addition, Knowles teaches that the motor is preferably an electromagnet which is coupled to the mirror 112 to oscillate it about the axis A through a predetermined arc, e.g., +/-7 degrees, to produce the desired line pattern. In the preferred embodiment the mirror is concave, but can be any other suitable shape, e.g., planar. The mirror 112 is mounted on a pivot arm (not shown) which is pivotally mounted on the support structure 114 at the location of the pivot axis A. The pivot arm includes a permanent magnet mounted at its free end. The electromagnet motor comprises an coil of electrically conductive wire forming a central bore in which the permanent magnet is located. The coil is arranged to be connected to current supply means (not shown) for providing electrical current pulses of opposite polarity to it to produce alternating direction electromagnetic fields. This action causes the magnet to be pulled and pushed into and out of the bore, thereby causing the arm to oscillate about axis A (see Figure 3, col 6, lines 46-63). Seven degrees is on the order of 20 degrees for the scan range.

In view of the teaching of Bard and Knowles, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a scan angle (i.e. range of oscillation) of +/- 20 degrees since this angle will allow enough movement away from the perpendicular to encompass a good scanning range.

Regarding claims 7-11, 13-14, 18-21, 26-27, 34-35, 37-40, and 42-46, Krichever fails to teach specific components of the magnetic set-up (i.e. electromagnetic coil, mechanical pivot, and spring-like members that attach the system together).

Bard teaches a mirrorless ring mounted miniature optical scanner. Bard teaches that to reduce the size and weight of an optical scanner, the present invention provides a mirrorless beam scanning unit wherein the light emitter itself moves back and forth. In the preferred embodiments the light emitter is a visible light diode (VLD) mounted on the axis of a rotatable shaft. The VLD emits light in a direction perpendicular to the axis of the shaft. A lever arm attached to the shaft and an induction motor for moving the arm repeatedly rotate the shaft back and forth through a small rotational arc. The mirrorless scanner is mounted on a finger sized ring. This allows a user to wear the miniature optical scanner on a finger. A separate unit houses the other components of the scanning system, such as the analog signal processing circuitry, digitizer, decoder and any necessary interface to a data processing system. The separate unit can be worn on the user's belt or in a pocket, and a cable connects the separate unit to the ring mounted scanner (see abstract). Bard discloses that FIG. 1 depicts a mirrorless scanning unit 1 of the present invention. A light emitter, such as a visible laser diode or VLD 11, emits a beam of light to generate a scan line. The VLD 11 may be mounted on the pivotable shaft of a motor or on any material means capable of producing oscillating motion. In the preferred embodiment of scanning unit 1, the VLD 11 is attached to the top end of a rotatable or pivotable shaft 13. The shaft 13 is pivotably mounted in a scanner base 50. The shaft can be installed either on any known Type of bearing or just

to rotate in the plastic body of base 50. The VLD 11 and shaft 13 together form a moving assembly 10 for scanning the beam of light from the VLD type light emitter. The moving assembly 10 also includes a collar 12 and a lever arm 14 attached to the shaft 13. A force applied to the end of lever arm 14 produces the oscillatory movement of assembly 10, as will be discussed later. The collar 12 secures the VLD 11 to the moving assembly 10. In the preferred embodiment, the VLD 11 is secured at a point atop of the shaft 13, such that VLD 11 is effectively located on the pivot axis of the shaft 13 and aligned to emit light in a direction perpendicular to the axis of the shaft. Other arrangements of the VLD and shaft are possible. For example, the VLD could be located at a position offset from the axis. Also, the collar could support the VLD at an angle with respect to the shaft. FIG. 2 illustrates the relationship of the motion and light emission of the VLD 11 to the axis of the shaft 13. The short rotational arc o about the shaft axis represents the back and forth pivotal oscillation of the VLD 11. The VLD 11 emits light in direction I toward a targeted object, such as a bar code (not shown). As the VLD 11 of assembly 10 oscillates back and forth through the small rotational arc o, the emitted light I will scan back and forth across the targeted image. As shown in FIG. 1, three thin wires 15 connect the leads of the VLD 11 on one side to a stationary holder 17 on the other. Alternatively, one flexible cable could be used. In the preferred embodiment, the wires 15 or cable are attached to an intermediate fixing point 16 atop the collar 12. The point 16 is located at the axis of the oscillation of moving assembly 10 and shaft 13 to minimize tension on the lead wires due to the zero linear speed at that point. Alternatively, the wires could be slack and hang loose or be coiled, so long as the

wires provide a flexible connection to the oscillating VLD. A variety of devices can be used to provide the force to oscillate the moving assembly 10 about the axis of shaft 13. In the illustrated embodiment, the oscillation of the assembly is provided by a so-called induced magnetization motor (hereinafter IMM). The IMM type motor has been disclosed in commonly assigned application Ser. No. 07/520,464, filed on May 8, 1990, entitled SCANNING ARRANGEMENT. In the prior application the IMM oscillated a scanning mirror. The disclosure of this commonly assigned application is herein incorporated by reference. In the IMM type motor, a restoring force is provided by the combination of a fixed position core and coil with a moveable permanent magnet. If the permanent magnet is mounted on the end of a lever arm attached to rotatable shaft, the force takes the form of a torque about the axis of the shaft. In the present embodiment of the IMM, a core 21 comprises a bobbin around which the coil 23 is wound such that the core and coil are entirely concentric to minimize size and weight. The permanent magnet 25 is rigidly mounted at the end of the lever arm 14 of the moving assembly 10. Location of the permanent magnet 25 at a distance from the axis of the shaft 13 causes the magnetic force applied to the lever arm 14 through the permanent magnet 25 to produce a torque about the axis of the shaft 13 (see Figures 1-2, col 5 line 19 to col 6 line 25).

In addition, Knowles teaches that the motor is preferably an electromagnet which is coupled to the mirror 112 to oscillate it about the axis A through a predetermined arc, e.g., +/-7 degrees, to produce the desired line pattern. In the preferred embodiment the mirror is concave, but can be any other suitable shape, e.g., planar. The mirror 112 is

mounted on a pivot arm (not shown) which is pivotally mounted on the support structure 114 at the location of the pivot axis A. The pivot arm includes a permanent magnet mounted at its free end. The electromagnet motor comprises an coil of electrically conductive wire forming a central bore in which the permanent magnet is located. The coil is arranged to be connected to current supply means (not shown) for providing electrical current pulses of opposite polarity to it to produce alternating direction electromagnetic fields. This action causes the magnet to be pulled and pushed into and out of the bore, thereby causing the arm to oscillate about axis A (see Figure 3, col 6, lines 46-63).

In view of the teaching of Bard and Knowles, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ these features in order for the system to work properly (i.e. the magnet being mounted to the substrate in order for it to be in the proper position, the mechanical pivot allowing for scan angles, and the resilient members to attach the components together).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krichever as modified by Bard and Knowles, and further in view of Srey et al. (U.S. Patent No. 6,141,436, from hereinafter "Srey"). The teachings of Krichever as modified by Bard and Knowles have been discussed above.

Krichever/Bard/Knowles fails to disclose that the device is a mobile phone, pager, or personal data assistant.

Srey teaches a portable communication device having a fingerprint identification system. Srey discloses a portable communication device (100, 300, 400, 500) comprises a fingerprint identification system (709) including a scanner (115) for scanning a fingerprint (123) of a finger (121) to generate an image of the fingerprint (123). In a first embodiment, the scanner (115) is positioned relative to a switch (201) on the device (100, 300, 400, 500) to permit the finger (121) to generate the actuation force for the switch (201) when the fingerprint (123) is positioned on the scanner (115). In a second embodiment, the scanner (115) is ergonomically positioned on a housing (113, 117, 119) of the device (100, 300, 400, 500) where the finger (121) or a thumb naturally rests on the housing (113, 117, 119) when the person holds the housing (113, 117, 119) while the device (100, 300, 400, 500) is in use. In a third embodiment, a transmitter (205) of the device (100, 300, 400, 500) transmits data representative of the image of the fingerprint (123) to a remote site (715) when data representative of the image of the fingerprint (123) does not match data representative of a reference fingerprint (see abstract). The fingerprint scanner here can be analogous to a barcode scanner since both devices obtain information in a technologically advanced manner.

In view of the teaching of Srey, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a barcode scanner within a phone in order to have a comprehensive system that is able to accomplish different tasks at the same time so that time is saved and businesses can run smoothly.

4. Claims 4, 23, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krichever as modified by Bard and Knowles, further in view of Stern et al. (EP

0731417, from hereinafter "Stern"). The teachings of Krichever as modified by Bard and Knowles have been discussed above.

Krichever/Bard/Knowles fail to teach that the laser light source comprises a VCSEL chip.

Stern teaches a scan module for an optical scanner. Stern discloses an integrated optical module for an optical scanner has a lens (24) spaced from a vertical-cavity surface-emitting laser (VCSEL) (28) by a spacer (62). The module, in an alternative embodiment, may include a wafer frame (12), a suspended mirror (14) mounted for oscillation on the frame, a wafer substrate (108) bonded beneath the frame and a wafer cover (109) bonded above the frame. The cover includes a mirror travel stop (116) to protect the mirror against shock. A VCSEL mounted to the wafer cover produces a beam which is shaped and deflected by a diffractive optical element (22,24) onto the oscillating mirror. The reflected beam passes out of the module toward an indicia to be read. Large numbers of such devices may be fabricated relatively cheaply using wafer-scale processing and assembly technology. Three large wafers (1100,1102,1104) are fabricated corresponding respectively to arrays of substrates, frames and covers. The large wafers are bonded together in a sandwich arrangement, and are then diced to produce the individual scan modules. The modules may provide either one-dimensional or two-dimensional scanning (see Figure 9, abstract).

In view of the teaching of Stern, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a VCSEL laser chip because VCSELs have comparable performances to LEDs and CD lasers at lower

costs (i.e. comparable to LED solutions). VCSELs emit light vertically from the wafer surface, like LEDs. However, they produce a smaller divergence beam than LEDs. Their fabrication and testing is compatible with standard I.C. procedures and equipment. In addition, it is well known in the art that VCSELs are faster, more efficient. Hence it is favorable to use VCSELs.

5. Claims 5, 24, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krichever as modified by Bard and Knowles, further in view of Kodukula et al. (U.S. Patent No. 6,195,053, from hereinafter "Kodukula"). The teachings of Krichever as modified by Bard and Knowles have been discussed above.

Krichever/Bard/Knowles fail to teach that at least one light receiving photodiode comprises a CCD device.

Kodukula teaches an antenna, module and imager for a barcode reader. Kodukula discloses that the reader 600 further includes an optical scanner or symbology reader 628 for reading machine-readable symbols, such as the barcode, stacked or area code symbol 604 (FIG. 6). The symbology reader 628 can include a scan engine 630 including optical elements and a transducer, such as an optical detector 632, suitable for directing light reflected from the machine-readable symbol 604 to the scan engine 630. The optical detector 632 can convert reflected light into an analog electrical signal. Suitable optical detectors includes photodiode arrays, one- and two-dimensional semi-conductor arrays, linear and two-dimensional charge coupled devices ("CCD"), and Vidicons. The scan engine 630 can also include an illumination source (not shown), such as light emitting diodes (LED) or a laser. The scan engine

may additionally include moving components, such as mirrors and/or beam splitters (not shown) to scan the illumination source. The scan engine 630 may further include an analog-to-digital converter (not shown) for transforming the analog electrical signal into a digital signal to be supplied to a processor such as the microprocessor 614 for decoding (see Figures 6-7, col 5 line 61 to col 6 line 14). CCD devices are well known in the art to be inexpensive and efficient (i.e. capable of good resolution, able to be used with sophisticated software, technologically advanced).

In view of the teaching of Kodukula, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a CCD device as one of the photodiode because it is well known in the art to be an efficient means of providing information for images and is advantageous over other integrated circuits due to its favorable attributes (i.e. versatility, resolution).

Response to Arguments

6. Applicant's arguments with respect to claims 1-40 and 42-46 have been considered but are moot in view of the new ground(s) of rejection.

Examiner appreciates applicant's arguments that neither Krichever nor Bard disclose specifically at least one flexible connector mechanically coupling a scanner and a circuit board such that a range of oscillation between the scanner and the circuit board is possible through at least one flexing action of the connector and has provided new prior art in the form of Knowles to overcome this limitation. It is appropriate to combine Krichever, Bard, and Knowles because all three references teach optical data scanner modules for use in scanning items.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ***Lisa M. Caputo*** whose telephone number is **(703) 308-8505**. The examiner can normally be reached between the hours of 8:30AM to 5:00PM Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone number for this Group is (703)308-7722, (703)308-7724, or (703)308-7382.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [**lisa.caputo@uspto.gov**].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

LMC
July 21, 2003

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